CLAIMS:

1. A fuel cell stack comprising:

one or more fuel cell assemblies; and

one or more thermoelectric layers, each layer comprising one or more thermoelectric devices, and wherein each layer is in contact with at least one of said fuel cell assemblies.

2. The fuel cell stack according to claim 1, wherein the thermoelectric layer further comprises one or more temperature-sensing devices.

3. The fuel cell stack according to claim 1, wherein each thermoelectric layer is located between adjacent fuel cell assemblies.

4. The fuel cell stack according to claim 3, wherein a thermoelectric layer is located between each pair of adjacent fuel cell assemblies.

5. The fuel cell stack according to claim 1, wherein the one or more thermoelectric devices are Peltier devices.

6. The fuel cell stack according to claim 1, wherein the one or more temperature-sensing devices are thermocouples.

7. The fuel cell stack according to claim 1, wherein the thermoelectric devices and the temperature-sensing devices in each layer are arranged in an alternating configuration.

8. The fuel cell stack according to claim 1, wherein each thermoelectric device is electrically connected to a battery.

9. The fuel cell stack according to claim 1, wherein each thermoelectric device is electrically connected to at least one of the fuel cell assemblies.

10. The fuel cell stack according to claim 1, wherein the fuel cell assembly is selected from the group consisting of a proton exchange membrane fuel cell, a phosphoric acid fuel cell, a molten carbonate fuel cell, a solid oxide fuel cell, and an alkaline fuel cell.

11. A fuel cell system comprising the fuel cell stack according to claim 1 and a heat source/sink.

12. A method for controlling a temperature of a fuel cell assembly, wherein the fuel cell assembly comprises one or more thermoelectric layers, each layer comprising one or more thermoelectric devices in electrical communication with a power source, and wherein each layer is in contact with at least one of said fuel cell assemblies, the method comprising:

measuring the temperature of the fuel cell assembly adjacent to the thermoelectric layers at one or more locations across the fuel cell assemblies; and

adjusting a voltage of the power source in response to the measured temperatures to increase or decrease the temperature at the one or more locations of the fuel cell stack.

13. The method according to claim 12, wherein the thermoelectric devices are Peltier devices.

14. The method according to claim 12, wherein the power source is a battery.

15. The method according to claim 12, wherein the power source is the fuel cell assembly.

16. The method according to claim 12, wherein the fuel cell assembly is selected from the group consisting of proton exchange membrane fuel cell, phosphoric acid fuel cell, molten carbonate fuel cell, solid oxide fuel cell and alkaline fuel cell.

17. The method according to claim 12, further comprising contacting the fuel cell assembly with a heat sink to further decrease the temperature.

18. A method of controlling a temperature of a fuel cell stack, comprising:

providing one or more thermoelectric layers in between adjacent fuel cell assemblies in the fuel cell stack, wherein the thermoelectric layers each comprise one or more thermoelectric devices, each thermoelectric device in electrical communication with a power source;

providing a heat sink in thermal contact with the fuel cell stack;

measuring the temperature of fuel cell assemblies adjacent to the thermoelectric layers at one or more locations across the fuel cell assemblies; and

adjusting the voltage of the power sources in response to the measured temperatures to increase or decrease the temperature at the one or more locations of the fuel cell stack.

19. The method according to claim 17, wherein each thermoelectric layer further comprises one or more temperature-sensing devices each associated with one or more thermoelectric devices and connected via control circuitry to the power sources to which the associated thermoelectric devices are connected.

20. The method according to claim 17, wherein the thermoelectric devices are Peltier devices.

21. The method according to claim 18, wherein the temperature sensing devices are thermocouples.

22. The method according to claim 17, wherein at least one of the one or more power sources is a battery.

23. The method according to claim 17, wherein at least one of the one or more power sources is a fuel cell.

24. The method according to claim 17, wherein the fuel cell assembly comprises a plurality of stacked fuel cells selected from the group consisting of a proton exchange membrane fuel cell, a phosphoric acid fuel cell, a molten carbonate fuel cell, a solid oxide fuel cell, and an alkaline fuel cell.

25. The method according to claim 17, wherein the temperature is substantially uniform across the fuel cell assembly and the fuel cell stack.